

Applications Involving Quadratic Equations

Solving Problems

Examples (pg. 526-527):

1. Fiona rode her motorcycle 300 miles at a certain average speed. Had she traveled 10 mph faster, the trip would have taken 1 hour less. Find Fiona's average speed.
2. The time t required for a pendulum of length l to swing back and forth (complete one period) is given by the formula $T = 2\pi\sqrt{\frac{l}{g}}$, where g is the earth's gravitational constant. Solve for l .
3. An athlete's "hang time" is the amount of time that the athlete can remain airborne when jumping. A formula relating an athlete's vertical leap V , in inches, to hang time T , in seconds, is $V = 48T^2$. Solve for T .
4. An object tossed downward with an initial speed (velocity) of v_0 will travel a distance of s meters, where $s = 4.9t^2 + v_0t$ and t is measured in seconds. Solve for t .

To Solve a Formula for a Letter – Say, h

1. Clear fractions and use the principle of powers, as needed. Perform these steps until radicals containing h are gone and h is not in any denominator.
2. Combine like terms
3. If the only power of h is h^1 , the equation can be solved (like example 2 above.)
If h^2 appears but h does not, solve for h^2 and use the principle of square roots to solve for h (like example 3 above.)
4. If there are terms containing both h and h^2 , put the equation in standard form and use the quadratic formula, (Like example 4)